

Exhibit 4

EVIDENCE OF USE FOR U.S. PATENT NO. US6510148

Title: Selective discontinuous transmission for high speed data services in CDMA multi-channel configuration

Application No.: US09/694,698

Filing Date: 2000-10-23

Issue Date: 2003-01-21

Accused Product/Standard:

ZTE

ZTE Z793C



SPECS

Technology

CDMA2000 1X

ZTE Atrium Smartphone Full Specification

Detailed Technical Specifications

General Information

Selling Price

USD \$45

Source: <https://www.pdevice.com/product/zte-atrrium-price-specs>

ZTE Atrium - Specifications

Model alias

Alternative names, under which the model is known.

Z793c


Head SAR (USA)

This SAR rating shows the maximum level of exposure to electromagnetic radiation taken when the device is placed next to the ear. The applicable limit for the US is 1.6 W/kg per 1 g of tissue. In the US the FCC tests and sets the SAR limits for all mobile devices, which are controlled by the CTIA.

Source: <https://www.devicespecifications.com/en/model/848c3d4c>

Source: <https://www.cnet.com/products/zte-z793c-black-3g-4-gb-cdma-smartphone/>

Evidence of Use

Claim Language	Evidence of Infringement
<p>1. A method for operating a mobile station having an output power limit, the method comprising the steps of:</p>	<p>ZTE Z793C smart phone supports CDMA 2000 technology. As shown in the screenshot attached below, ZTE Z793C was sold at a price of 45 USD therefore it can be inferred that the given model was available in the US markets. The 3GPP2 C.S0002-E standard is a Physical layer standard for CDMA2000 spread spectrum system. The specification provides a method of power control at mobile station.</p> <p>ZTE</p> <p>ZTE Z793C</p>  <p>SPECS</p> <p>CELLULAR</p>

Claim Language	Evidence of Infringement
	<div data-bbox="583 280 1388 337"> TechnologyCDMA2000 1X </div> <div data-bbox="596 367 1457 394"> Type smartphone (Android OS) </div> <div data-bbox="596 436 1234 462"> Navigation GPS </div> <div data-bbox="583 496 1457 548"> BandCDMA2000 1X1900/800 </div> <div data-bbox="569 594 1694 764"> <p>Source: https://www.cnet.com/products/zte-z793c-black-3g-4-gb-cdma-smartphone/ ZTE Atrium Smartphone Full Specification Detailed Technical Specifications General Information</p> <div data-bbox="596 784 1073 854"> <div>Selling Price</div> <div>USD \$45</div> </div> <p>Source: https://www.pdevice.com/product/zte-atrrium-price-specs</p> <p>ZTE Atrium - Specifications</p> <div data-bbox="590 1036 844 1089"> Head SAR (USA) </div> <p>This SAR rating shows the maximum level of exposure to electromagnetic radiation taken when the device is placed next to the ear. The applicable limit for the US is 1.6 W/kg per 1 g of tissue. In the US the FCC tests and sets the SAR limits for all mobile devices, which are controlled by the CTIA.</p> <p>Source: https://www.devicespecifications.com/en/model/848c3d4c</p> </div>

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	<p>4 2.1.2.3.2 Closed Loop Output Power</p> <p>5 <u>For the Reverse Traffic Channel with Radio Configuration 1 or 2, if the mobile station is</u> 6 <u>unable to transmit at the requested output power level, it shall discontinue transmission</u> 7 on at least one active Reverse Supplemental Code Channel, not later than the transmission 8 of the next 20 ms frame to maintain the requested output power on the Reverse 9 Fundamental Channel.</p> <p><u>The mobile station shall provide a closed loop adjustment range greater than ± 24 dB</u> <u>around its open loop estimate.</u></p> <p>2.1.2.1 Maximum Output Power</p> <p>The mobile station shall meet the requirements in Sections 4.4.5 and 5.1 of the current version of [11]. <u>The mobile station shall limit its transmission power to no more than the value indicated by the TX_PWR_LIMIT_s when operating in the 1915MHz – 1920MHz block of the PCS band.</u></p> <p>Source: 3GPP2 C.S0002-E v3.0, at page 87, 98 & 100 of 568.</p>
<p>establishing a wireless data communication from a transmitter of the mobile station to a receiver of the base station at a predetermined data rate simultaneously through at least one channel;</p>	<p>The specification allows the establishment of a wireless data communication from the transmitter of the mobile station to the receiver of the base station at a predetermined data rate simultaneously through at least one data channel. For example, a wireless data communication is established between the mobile station and the base station through the reverse fundamental channel and reverse supplemental code channel (“at least one data channel”) at predetermined data rates.</p> <p><u>Reverse Fundamental Channel. A portion of a Radio Configuration 1, 2, 3, 4, 5, 6, and 8 Reverse Traffic Channel which carries higher-level data and control information from a mobile station to a base station.</u></p>

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	<p><u>Reverse Supplemental Code Channel.</u> A portion of a Radio Configuration 1 and 2 Reverse Traffic Channel which operates in conjunction with the Reverse Fundamental Channel in that Reverse Traffic Channel, and (optionally) with other Reverse Supplemental Code Channels to provide higher data rate services, and on which higher-level data is transmitted.</p> <p style="text-align: right;">Source</p> <p>e: 3GPP2 C.S0002-E v3.0, at page 67 & 68 of 568.</p> <p>2.1.3.12.1 Reverse Fundamental Channel Time Alignment and Modulation Rates</p> <p><u>When operating with Radio Configuration 1, the mobile station shall transmit information on the Reverse Fundamental Channel at variable data rates of 9600, 4800, 2400, and 1200 bps.</u></p> <p>2.1.3.14.1 Reverse Supplemental Code Channel Time Alignment and Modulation Rates</p> <p><u>When transmitting on Reverse Supplemental Code Channels with Radio Configuration 1, the mobile station shall transmit information at 9600 bps. When transmitting on Reverse Supplemental Code Channels with Radio Configuration 2, the mobile station shall transmit information at 14400 bps.</u></p> <p style="text-align: right;">:</p> <p>Source: 3GPP2 C.S0002-E v3.0, at page 302 & 279 of 568.</p>
<p>receiving a command from the base station to increase a transmission power of the mobile station transmitter;</p>	<p>The specification allows the reception of a command by the mobile station to increase the power of a transmission from the mobile station transmitter. For example, the transmission of power control bits ("command") from the base station towards the mobile device via Forward Power Control Subchannel signals the mobile station to increase or decrease transmit power. Depending on the power control bits, the mobile station increases or decreases its output power. A '0' power control bit implies an increase in transmit power and a '1' power control bit implies a decrease in transmit power.</p>

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	<p><u>Power Control Bit.</u> A bit sent on the forward power control subchannel, reverse power control subchannel, or common power control subchannel <u>to signal the mobile station or base station to increase or decrease its transmit power except in the shared mode of operation on the forward link.</u></p> <p>3.1.3.1.12 Forward Power Control Subchannel</p> <p><u>A forward power control subchannel is transmitted only on the Forward Fundamental Channel or on the Forward Dedicated Control Channel.</u></p> <p><u>When the common power control subchannel is not assigned, the power control bit on the forward power control subchannel is defined as follows: a '0' bit shall indicate to the mobile station that it is to increase the mean output power level, and a '1' bit shall indicate to the mobile station that it is to decrease the mean output power level. The amount that the mobile station increases or decreases its power for every power control bit is specified in 2.1.2.3.2.</u></p> <p>Source: 3GPP2 C.S0002-E v3.0, at page 65, 458 & 459 of 568.</p> <p><u>The base station receiver shall estimate the received signal strength of the particular mobile station to which it is assigned over a 1.25 ms period. The base station receiver shall use the estimate to determine the value of the power control bit ('0' or '1'), except for the case where the Common Power Control Channel is also assigned to the mobile station. The base station shall transmit the power control bit on the Forward Fundamental Channel or on the Forward Dedicated Control Channel using the puncturing technique described below.</u></p> <p>Source: 3GPP2 C.S0002-E v3.0, at page 463 of 568.</p> <p>³⁴ shall be within ± 3.0 dB of 40 times the nominal change (10 dB). <u>A '0' power control bit</u></p>

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	<p>1 implies an increase in transmit power; and a '1' power control bit implies a decrease in 2 transmit power.</p> <p>Source: 3GPP2 C.S0002-E v3.0, at page 99, 100 of 568.</p>
<p>determining in the mobile station if the increased transmission power on at least one data channel will exceed the output power limit of the mobile station;</p>	<p>The specification allows the mobile station to determine if the increased transmission power will exceed a transmission power threshold value. For example, the mobile device provides a closed loop adjustment range greater than ± 24 dB around its open loop estimate and also the output power should not be more than defined by parameter TX_PWR_LIMITs ("transmission power threshold value").</p> <p>34 shall be within ± 3.0 dB of 40 times the nominal change (10 dB). <u>A '0' power control bit</u> 1 <u>implies an increase in transmit power;</u> and a '1' power control bit implies a decrease in 2 transmit power.</p> <p>Source: 3GPP2 C.S0002-E v3.0, at page 99, 100 of 568.</p> <p>4 2.1.2.3.2 Closed Loop Output Power</p> <p>5 <u>For the Reverse Traffic Channel with Radio Configuration 1 or 2, if the mobile station is</u> 6 <u>unable to transmit at the requested output power level,</u> it shall discontinue transmission 7 on at least one active Reverse Supplemental Code Channel, not later than the transmission 8 of the next 20 ms frame to maintain the requested output power on the Reverse 9 Fundamental Channel.</p> <p><u>The mobile station shall provide a closed loop adjustment range greater than ± 24 dB</u> <u>around its open loop estimate.</u></p>

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	<p>2.1.2.1 Maximum Output Power</p> <p>The mobile station shall meet the requirements in Sections 4.4.5 and 5.1 of the current version of [11]. <u>The mobile station shall limit its transmission power to no more than the value indicated by the TX_PWR_LIMIT_s when operating in the 1915MHz – 1920MHz block of the PCS band.</u></p> <p>Source: 3GPP2 C.S0002-E v3.0, at page 87, 98 & 100 of 568.</p>
<p>if so, reducing the data rate by disabling data transmission through at least one of the at least one data channel; increasing the transmission power on any of the at least one data channel that carry data transmissions after the step of reducing the data rate is performed;</p>	<p>The specification allows the mobile device to reduce the data rate by disabling data transmission through the at least one of the at least one data channel to increase the transmission power of any of the at least one data channel that carry data transmission. For example, the mobile device increases the transmission power by discontinuing the data transmission through at least one active reverse supplemental code channel (“at least one data channel”).</p> <p>4 2.1.2.3.2 Closed Loop Output Power</p> <p>5 <u>For the Reverse Traffic Channel with Radio Configuration 1 or 2, if the mobile station is</u> 6 <u>unable to transmit at the requested output power level, it shall discontinue transmission</u> 7 <u>on at least one active Reverse Supplemental Code Channel, not later than the transmission</u> 8 <u>of the next 20 ms frame to maintain the requested output power on the Reverse</u> 9 Fundamental Channel.</p> <p>Source: 3GPP2 C.S0002-E v3.0, at page 98 & 100 of 568.</p> <p>Reverse Supplemental Code Channel</p> <p>An optional portion of a Reverse Traffic Channel which operates with the Fundamental Channel to provide higher data rate services. The Supplemental Channel that is transmitted on the Reverse CDMA Channel. This channel allows a combination of primary data, secondary data, or both to be transmitted. It does not however support signalling.</p>

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	<p>External Source: https://www.mpirical.com/glossary/reverse-supplemental-code-channel</p>
<p>receiving a command from the base station to decrease the transmission power of the mobile station;</p>	<p>The specification allows the mobile device to receive the command from the base station to increase the power of transmission from the mobile station. For example, the mobile station receives a power control bit (“command”) from the base station which indicates the mobile station to increase its output power level.</p> <p><u>Power Control Bit.</u> A bit sent on the forward power control subchannel, reverse power control subchannel, or common power control subchannel to signal the mobile station or base station to increase or decrease its transmit power except in the shared mode of operation on the forward link.</p> <p>3.1.3.1.12 Forward Power Control Subchannel</p> <p><u>A forward power control subchannel is transmitted only on the Forward Fundamental Channel or on the Forward Dedicated Control Channel.</u></p> <p>When the common power control subchannel is not assigned, the power control bit on the forward power control subchannel is defined as follows: a ‘0’ bit shall indicate to the mobile station that it is to increase the mean output power level, and <u>a ‘1’ bit shall indicate to the mobile station that it is to decrease the mean output power level.</u> The amount that the mobile station increases or decreases its power for every power control bit is specified in 2.1.2.3.2.</p> <p>Source: 3GPP2 C.S0002-E v3.0, at page 65, 458 & 459 of 568.</p>
<p>determining in the mobile station if the decreased</p>	<p>As per the claim limitation, if the base station instructs the mobile station to reduce power, then the mobile should increase the data rate through the data channel on which the communication</p>

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<p>transmission power, assuming that a disabled data channel were once more enabled, will not exceed the output power limit of the mobile station; if so, increasing the data rate by enabling data transmission through at least one previously disabled data channel; and decreasing the transmission power on any of the at least one data channel that carry data transmissions after the step of increasing the data rate is performed.</p>	<p>was previously reduced/discontinued.</p> <p>The specification provides a reference where the transmissions on the supplemental code channel are discontinued if the output power of the mobile station exceeds the limits. Thus, at this point, only the fundamental channel is activated. Since the mobile station increases the transmission power by disabling communication on supplement code channel i.e., lowering the data rate (because requested transmission power exceeded the limits), this implies that there is inverse relationship between the data rate and transmission power of the mobile station.</p> <p>Accordingly, upon receiving a command to lower the transmission power to bring the power within the threshold limits, any application at the mobile station which requires higher data rates that cannot be fulfilled by the fundamental channel alone would result in resumption of the communication on the supplemental channel to meet the higher data rate demand imposed by the application.</p> <p>Power Control Bit. <u>A bit sent on the forward power control subchannel, reverse power control subchannel, or common power control subchannel to signal the mobile station or base station to increase or decrease its transmit power except in the shared mode of operation on the forward link.</u></p> <p>5 <u>For the Reverse Traffic Channel with Radio Configuration 1 or 2, if the mobile station is</u> 6 <u>unable to transmit at the requested output power level, it shall discontinue transmission</u> 7 <u>on at least one active Reverse Supplemental Code Channel, not later than the transmission</u> 8 <u>of the next 20 ms frame to maintain the requested output power on the Reverse</u> 9 <u>Fundamental Channel.</u></p> <p><u>The mobile station shall provide a closed loop adjustment range greater than ± 24 dB around its open loop estimate.</u></p>

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	<p>2.1.2.1 Maximum Output Power</p> <p>The mobile station shall meet the requirements in Sections 4.4.5 and 5.1 of the current version of [11]. <u>The mobile station shall limit its transmission power to no more than the value indicated by the TX_PWR_LIMIT_s when operating in the 1915MHz – 1920MHz block of the PCS band.</u></p> <p>Source: 3GPP2 C.S0002-E v3.0, at page 65, 98 & 100 of 568.</p> <p>Reverse Supplemental Code Channel. A portion of a Radio Configuration 1 and 2 Reverse Traffic Channel which operates in conjunction with the Reverse Fundamental Channel in that Reverse Traffic Channel, and (optionally) <u>with other Reverse Supplemental Code Channels to provide higher data rate services, and on which higher-level data is transmitted.</u></p> <p>Source: 3GPP2 C.S0002-E v3.0, at page 68 of 568.</p>